



“Summary of article by Henry M. Peskin with Ernst Lutz: A Survey of Resource and Environmental Accounting in Industrialized Countries” in Frontier Issues in Economic Thought, Volume 1: A Survey of Ecological Economics. Island Press: Washington DC, 1995. pp. 252-256

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## **“Summary of article by Henry M. Peskin with Ernst Lutz: A Survey of Resource and Environmental Accounting in Industrialized Countries”**

Current systems of national accounts (SNAs) reflect environmental and natural resource changes either poorly or not at all. The existing framework thus generates estimates of growth, income and well being that may be neither accurate nor sustainable. Developing countries' economies tend to be both more resource based and to have more severe environmental problems. As a consequence, traditional SNA methods will provide an even less accurate reflection of environmental realities than is the case in the industrialized countries. A number of industrialized countries are exploring various methods to incorporate environmental and natural resource data into their SNAs. This paper surveys some of the proposals and problems of these efforts, in the hopes that they may contain lessons for similar efforts in the developing countries. Indications are given of which countries currently use each method.

### **MODIFYING THE ACCOUNTS TO INCLUDE RESOURCES AND THE ENVIRONMENT: ALTERNATIVE APPROACHES**

In approaching the problem of altering SNAs, we must bear in mind the fact that these accounts serve the dual purpose of providing both a framework for compiling macroeconomic data and a measure of economic well being and performance. Attempts to incorporate environmental and natural resource data are complicated by the fact that no standard definition of national environmental and resource accounting exists. In addition, many of the methodologies surveyed here have not been adopted as standard practice by their respective countries. The following systems are ranked from those that require relatively modest adjustments in SNAs to those that would involve major restructuring of these accounts.

- 1) **Identification and Reclassification of Environmental Expenditures:** This approach proposes reclassifying expenditures on pollution abatement - currently accounted as final demands - and treating them instead as intermediate inputs, thereby subtracting them from GNP. Closely related to this suggestion is the idea of identifying all "defensive" consumption expenditures whose sole purpose is to ameliorate the ill effects of pollution - e.g., water filters, face masks used in Tokyo, etc. - and deducting them from GNP as well. These data on both environmental damage and defensive outlays can be useful even if they are not used to adjust the final aggregates. (France, Japan, Netherlands, Germany, and the US)
- 2) **Physical Resource Accounting Approaches:** In this approach there are a set of satellite accounts prepared utilizing an input/output format that describe the flows of resources,

materials (including pollutants) and energy that underlie any economic activity. These accounts could show depletions of resource stocks, additions to the resource base (through growth or discovery), contribution of resources to output, and the flow of pollutants from various industries. There are two types of physical accounts: a "stock account" indicates initial stocks, any additions and subtractions, and the final stocks of key natural resources, and a "pollutant account" typically describes air and water pollution generation by polluting source. However, since these types of accounts avoid valuation of stocks in monetary terms, it is difficult to use them to adjust the economic indicators found in most SNAs. Moreover, if they are to be comprehensive, the data can be very unwieldy and difficult to aggregate. (France and Norway)

- 3) **Depreciation of Marketed Natural Resources:** The focus here is on the failure of SNAs to depreciate environmental and natural resource assets as the economy expands. This approach generally emphasizes "material resources," in particular those resources that contribute directly to GNP (e.g., timber or oil) or that closely contribute to the making of a marketed product (e.g., topsoil). This approach is particularly relevant for resource-based developing economies where resource problems may be more important than environmental problems. (Indonesia, Costa Rica, China and the Repetto framework)
- 4) **Full Environmental and Natural Resource Accounts with Valuation:** This approach is the most ambitious, since its intent is to incorporate all of the elements of physical resource accounting and to assign monetary values to all physical entries. Thus an attempt is made to assign market values both for environmental and resource contributions to economic activity, as well as for losses in welfare due to environmental and natural resource degradation. The Dutch and the United Nations Statistical Office (UNSO) estimate the losses by calculating the cost to repair the damage, but this approach does not provide for evaluation of the efficiency of the policy. Peskin adopts a neoclassical framework in which benefit-cost calculations are based on estimates of willingness-to-pay to gain environmental benefits or to avoid costs. In practice, these estimates are derived from several environmental benefit-cost approximation methods. (Netherlands, UNSO and the Peskin framework)

## IMPLEMENTATION CONSIDERATIONS

All of these approaches encounter implementation problems.

- 1) **Difficulties in Estimating Pollution-Control Expenditures:** Costs may be difficult to identify because either they are not discrete or they are not identified as such in corporate accounts. Since this information is acquired through surveys, non-responsiveness is also a problem. Reliance upon theoretical engineering estimates of pollution abatement costs may also present problems of accuracy.
- 2) **Difficulties with Physical Accounting:** There are enormous practical problems in assembling data on stocks and flows of resources, and on their contributions to output and environmental degradation. The lack of a common monetary unit creates aggregation problems, as does the difficulty in identifying a single appropriate alternative (non-monetary) unit of measurement.

- 3) **Difficulties in Estimating Natural Resource and Environmental Depreciation:** Most criticisms of this approach have centered on the depreciation calculation, which is derived from multiplying the reduction in the resource stock by the difference between the market price of a good and the cost of extraction. The resulting figure is only an approximation of depreciation, and does not, for example, take into consideration profits that are reinvested in welfare enhancing ways. We must distinguish carefully between the depletion of a natural asset and its loss of economic value. Over-reliance on market valuation may underestimate the value of an asset; e.g., a forest may be worth more than the sum of its trees.
- 4) **Difficulties with Valuation in Estimating Environmental and Natural Resource Accounts:** In addition to the problems with assessing physical stocks and flows and assigning value to them cited above, there are also difficulties in estimating monetary values for services generated by environmental assets and for damages arising from consumption of these services. In particular, the willingness-to-pay concept is subjective and tends to favor the rich over the poor.

### **IMPLICATIONS FOR DEVELOPING COUNTRIES**

It is difficult to deduce clear lessons for the developing countries, as most of these accounting programs are in the early stages of development. Those that have been in use for some time are also the least ambitious. We do not conclude from this, however, that simpler is better. A simple, inexpensive data system that fails to facilitate the policy process is no bargain. On the other hand, a system that exceeds the collection capacity of a developing country is not effective either. The particular system developed in each instance must reflect the policy goals and the resources a nation is willing to devote to the process. Thus a system that succeeds or fails in an industrialized country may or may not inform the efforts to transform SNAs in a given developing country. The logistical problems encountered in implementation do provide lessons to assist developing countries in their own research efforts. Given the severity of environmental and natural resource problems in these countries, a productive strategy for them would be to initiate their own low cost pilot programs now.